

**2006**  
**Allegheny National Forest**  
**Viburnum Impact and**  
**Wildlife Crib Health**  
**Survey**



**Equipment needed:**

- GPS Unit
- Compass
- Maps and Datasheets
- Digital Camera

**About the plan:**

This plan is statistically based so the reliability of estimates can be defined, yet it is relatively straightforward in its execution and flexible enough to accommodate various sampling goals.

The need for this survey came from the increase in viburnum leaf beetle population and the defoliation of viburnum. ANF has invested \$(?) and the loss of viburnum in the cribs became a concern. Upon visiting a crib it was also noted that the dogwoods were defoliated because of dogwood sawfly. This resulted in a decision to assess the overall health of wildlife cribs.

This sampling plan was created using ANF wildlife food plot maps. Only plots defined as having “cribs” were considered and a subset of those plots with road access was selected. A “crib” is a fenced area of 350 – 500 (?) square feet containing shrubs such as viburnum, dogwood, sumac .

**About the insect:**

The viburnum leaf beetle, *Pyrrhalta viburni* (Paykull), first found in North America in 1947 in the Niagara Peninsula of Ontario, Canada, was discovered in New York State in northern Cayuga County (Fair Haven Beach State Park) in July, 1996. Native plantings of arrowwood (*Viburnum dentatum* complex) in the park were found to be heavily damaged by larval feeding. Many of these shrubs were nearly totally defoliated, and only wisps of skeletonized leaves remained on the branches. The first North American breeding populations of this European leaf beetle were discovered in 1978 in the Ottawa/Hull region of Canada, where they were causing severe defoliation of ornamental viburnums, particularly the popular European cranberrybush viburnum (*V. opulus*).

In Europe and North America, *P. viburni* overwinters in the egg stage. From late June to early July until October, females chew holes (1 x 1 mm) in small branches or twigs of viburnum (generally the current year's growth, but occasionally in the previous year's growth) for oviposition. These egg sites -- deep, rounded cavities -- are often arranged in a straight row on the under surface of the terminal twig. Several eggs (average of five) are inserted into each cavity. In excavating each egg site, the female chews away the bark, splits the wood into small fibers that remain attached to the upper circumference of the area chewed away, and hollows out the egg cavity by excavating the pith. After filling the cavity with eggs, the female closes the opening by making a "cap" or lid composed of excrement, chewed bark, and cement from her collateral glands and pushing it up beneath the cluster of previously shredded wood fibers. For several weeks, the color contrast

between the cap (brownish black) and the bark (green to brown) is sharp. This cap not only protects the eggs, but also sponges up and stores water that runs down the branch, thereby providing humidity for the eggs. A female can lay up to 500 eggs. By early to mid-May of the following spring, the eggs hatch and the greenish-yellow larvae (1 – 2mm long) feed gregariously on the underside of tender, newly expanding viburnum foliage. Larvae skeletonize viburnum foliage, usually starting with lower leaves and leaving only midribs and major veins intact. Mature larvae are 10mm long. By early to mid-June, mature larvae drop to the ground, enter the soil, and pupate. As the larvae mature, their bodies become covered in a pattern of dark spots and darken in color. The pupal stage lasts for about ten days. The span from egg hatch to adult can be as quick as two months. By early July, adults emerge and begin to feed on viburnum foliage. Complete development from egg hatch to adult emergence generally takes 8 to 10 weeks. Adult feeding damage consists of irregular circular holes, and severe feeding can nearly defoliate shrubs once again. From summer through fall, adults will continue to be active, mating, laying eggs on terminal twigs, and feeding upon foliage until the first killing frosts. There is one generation annually.

**Damage:** Viburnum leaf beetles feed on many species of Viburnum in both adult and larval stages. The beetles are very damaging because of this successive feeding by larvae followed by adults; bushes do not have time to re-vegetate between beetle stages. Two or three consecutive years of defoliation can cause significant die-back of the canopy and kill a bush.

The Viburnum leaf beetle may not only be a pest problem for gardeners and landscapers but may also cause problems for nurseries, growers, restoration programs and natural habitats.

This leaf beetle is restricted to feeding on species of *Viburnum*. It exhibits a strong preference for the popular arrowwood viburnums (*V. dentatum* complex), European cranberrybush viburnum (*V. opulus*), American cranberrybush viburnum (*V. trilobum*), and Rafinesque viburnum (*V. rafinesquianum*). Other viburnums also known to serve as hosts include Sargent viburnum (*V. sargentii*), wayfaringtree viburnum (*V. lantana*), nannyberry viburnum (*V. lentago*), and blackhaw viburnum (*V. prunifolium*). Particularly resistant species include Koreanspice viburnum (*V. carlesii*), Burkwood viburnum (*V. burkwoodii*), doublefile viburnum (*V. plicatum* var. *tomentosum*), Judd viburnum (*V. × juddii*), lantanaphyllum viburnum (*V. × rhytidiophylloides*), and leatherleaf viburnum (*V. rhytidiophyllum*).

**The purposes of this plan are:**

1. Locate a random accessible sample of “cribs”
2. Assess the health of the shrubs in the cribs
  - Grey dogwood (*Cornus racemosa*)
  - Red-osier dogwood (*Cornus stolonifera*)
  - Arrowwood (*Viburnum*)
  - Staghorn sumac (*Rhus typhina*)
  - Blueberry (*Vaccinium* spp)

American elder (*Sambucus canadensis*)

Chokeberry (red or black) (*Aronia* spp)

3. Determine actions to improve the health of the shrubs in the cribs

**What to look for:**



Newly hatched larvae feeding on Viburnum shrub.



Scars left on stems from overwintering eggs



Adult



Mature larvae on skeletonized Viburnum leaf.

1. Defoliation.
2. Wisps of skeletonized leaves remaining on the branches.
3. Dieback.
4. Egg sites (holes (1 x 1 mm) in small branches or twigs of viburnum (generally the current year's growth, but occasionally in the previous year's growth))-- deep, rounded cavities -- are often arranged in a straight row on the under surface of the terminal twig.
5. Egg site cap. The color contrast between the cap (brownish black) and the bark (green to brown) is sharp.
6. Insects (larvae and adults)
7. Spots on leaves.
8. Discoloration.
9. Anything "unusual".
10. Make notes on the condition of the fence.
11. Take picture.

**Where to look:** In the cribs.

**How many shrubs to examine:**

All those within the cribs.

Grey dogwood (*Cornus racemosa*)

Red-osier dogwood (*Cornus stolonifera*)

Arrowwood (*Viburnum*)

Staghorn sumac (*Rhus typhina*)  
Blueberry (*Vaccinium* spp)  
American elder (*Sambucus canadensis*)  
Chokeberry (red or black) (*Aronia* spp)

**How to look:**

1. Look at each shrub of each species and estimate percent of defoliation and/or any other abnormality.
  - a. Stand at the edge of the crib fence.
  - b. Fill out the data sheet.

If you encounter any situations or have any questions, give me a call at the office (304) 285-1544, cell (304) 376-2951, or at home (304) 594-3353.